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Biomedical Engineering

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Colony Picking & Colony PCR

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1 Colony Picking

Estimated bench time: 10 minutes per plate
Estimated total time: 10 minutes per plate
Purpose: Picking single colonies for further processing

It is essential to work sterile, thus disinfect your hands and work near a Bunsen Burner.

1.1 Materials

- Autoclaved Eppendorf tubes
- Autoclaved H_2O
- Bunsen Burner
- Pipettes and tips
- Plates with the bacterial colonies

1.2 Setup & Protocol

- Fill out Eppendorf tubes with 15 µl autoclaved H_2O.
- Pick bacterial colonies (±5 per plate) near the Bunsen flame with a pipette tip.
- Place the colonies into correct labeled Eppendorf tubes.
- Pipette up and down such that they are mixed well.

2 Colony PCR

Estimated bench time: 30 minutes
Estimated total time: 10 minutes per plate
Purpose: Verifying if the colony contains the correct insert.

When performing a colony PCR, you are working with bacteria close to a Bunsen Burner. Make sure to disinfect your hands. When preparing the MasterMix, make sure to use gloves to protect the MasterMix from DNase activity.

2.1 Materials

- 2X KAPA2G mix
- Autoclaved H_2O
- Bucket with ice
- Pair of primers which correspond to correct binding sites on the vector
- PCR tubes
- Pipettes and tips
- The colonies (from colony picking)
- Thermal cycler

2.2 Setup & Protocol

- For one colony PCR reaction, the following mix should be made:

Component	Quantity/mass/final concentration	Volume (µl)
DNA (from bacteria)	Pipette tip in 15 µl H_2O	1
2x KAPA2G mix	1x	12.5
Primer FW	0.5 µM (stock: 10 µM)	1.25
Primer RV	0.5 µM (stock: 10 µM)	1.25
H_2O		9
Total		*25*

- In order to simplify this step, prepare a MasterMix (2-3 reactions in excess). Keep the mix on ice. Do not add the bacterial DNA but take it into account while calculating the amount of required H_2O.

Component	Quantity/mass/final concentration	Volume (µl)
DNA (from bacteria)	Pipette tip in 15 µl H_2O	1 for each separate PCR mixture
2x KAPA2G mix	1x	
Primer FW	0.5 µM (stock: 10 µM)	
Primer RV	0.5 µM (stock: 10 µM)	
H_2O		
Total		

- Run the following PCR program:

Step	Temp (°C)	Time (sec)	Cycles
Initial denaturation	95	180 (3 min)	1
Denaturation Annealing Extension	95 X[1] 72	15 15 20 sec/kb	35
Final extension	72	600 (10 min)	1
Cooling	4	Hold	1

3 Gel electrophoresis

Estimated bench time: 40 minutes
Estimated total time: 1.5 hours
Purpose: Agarose gel electrophoresis may be used to verify the purity of your PCR product. If the product is pure, a single bond will show up during the gel electrophoresis.

For more information, see our general Agarose Gel Electrophoresis protocol.

[1] The annealing temperature can be calculated for the set of primers using New England Biolabs Tm calculator. An annealing temperature of 3°C lower than the lowest melting temperature was used to increase yields.